

(19) World Intellectual Property
Organization
International Bureau



(43) International Publication Date
30 June 2005 (30.06.2005)

PCT

(10) International Publication Number
WO 2005/059537 A1

(51) International Patent Classification⁷: **G01N 27/447**,
C12N 11/08

(21) International Application Number:
PCT/US2004/041640

(22) International Filing Date:
13 December 2004 (13.12.2004)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
10/734,998 12 December 2003 (12.12.2003) US

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(81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.

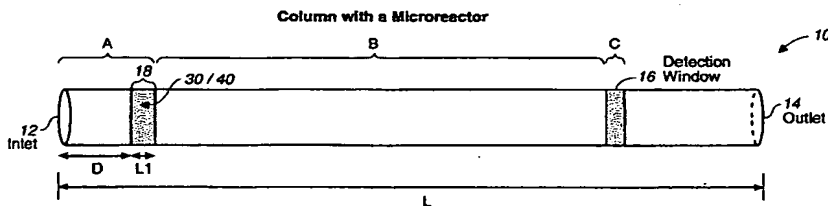
(84) Designated States (unless otherwise indicated, for every kind of regional protection available): ARIPO (BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IS, IT, LT, LU, MC, NL, PL, PT, RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Published:

- with international search report
- before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(54) Title: **IMMOBILIZED-ENZYME MICROREACTOR DEVICES FOR CHARACTERIZATION OF BIOMOLECULAR ANALYTES AND ASSOCIATED METHODS**



(57) Abstract: A method that comprises providing a polymerized sol-gel material (PSG) and linking an enzyme to a surface of the PSG via covalent linkage is provided. The surface of the PSG is derivatized with a linker that comprises a functional group for linking itself to the surface of the PSG and a functional group for linking itself with then enzyme. The linked-enzyme PSG, or microreactor, is an effective means of at least partially digesting a substrate, such as a biological substrate. The activity of the enzyme of the microreactor may be significantly enhanced, up to 200-fold for example, relative to the activity of the enzyme free of the microreactor. The microreactor is thus an effective vehicle for digesting a substrate such as a biomolecule, a protein, an oligonucleotide, a peptide, a steroid, and/or an organic acid, after which, any remaining substrate and one or more digestion product(s) may be separated and detected. Microreactors and integrated devices that incorporate microreactors, such as columns, pipet tips, wells, and well-plates, are also provided.

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